

## ABSTRACT

A composite waveguide for evanescent sensing in fluorescent binding assays comprising a substrate layer having one or more thin film waveguide channels deposited thereon. Binding molecules having the property of binding with specificity to an analyte are immobilized on the surface of the thin film channels. In preferred embodiments, the composite waveguide includes integral light input coupling means adapted to the thin film channels. Light coupling means may include a grating etched into the substrate prior to deposition of the thin film, or a waveguide coupler affixed to the upper surface of the thin film. The waveguide coupler has an input waveguide of high refractive index which receives the laser light through one end, propagating it by total internal reflection. Propagated light is coupled evanescently into the thin film across a spacer layer of precise thickness with a lower index of refraction than the input waveguide or the thin-film waveguide.

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